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Wall et al.

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(54) **SCANNER-ILLUMINATED LCOS PROJECTOR FOR HEAD MOUNTED DISPLAY**

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(57) **ABSTRACT**

A light engine comprises a liquid crystal on silicon (LCOS) panel that is operated in combination with illumination and imaging optics to project high-resolution virtual images into a waveguide-based exit pupil expander (EPE) that provides an expanded exit pupil in a near-eye display system. In an illustrative example, the illumination optics comprise a laser that produces illumination light that is reflected by a MEMS (micro-electromechanical system) scanner using raster scanning to post-scan optics including a microlens array (MLA) and one or more collimating or magnifying lenses before impinging on the LCOS panel. The LCOS panel operates in reflection in combination with imaging optics, including one or more of beam-steering mirror and beam splitter, to couple virtual image light from the LCOS panel into the EPE.

20 Claims, 17 Drawing Sheets

